

- (1) Cotyledons:
 - (i) Less than half of the original cotyledon tissue remaining attached.
 - (ii) Less than half of the original cotyledon tissue free of necrosis or decay.
- (2) Epicotyl:
 - (i) Missing. (May be assumed to be present if cotyledons are intact.)
 - (ii) [Reserved]
- (3) Hypocotyl:
 - (i) Deep open cracks or grainy lesions extending into the conducting tissue.
 - (ii) Malformed, such as markedly shortened, curled, or thickened.
 - (iii) Watery.
- (4) Root:
 - (i) None.
 - (ii) Weak, stubby, or missing primary root with weak secondary or adventitious roots.
- (5) Seedling:
 - (i) One or more essential structures impaired as a result of decay from primary infection.
 - (ii) Albino.

[59 FR 64506, Dec. 14, 1994]

§ 201.56–12 Miscellaneous plant families.

- Kinds of seed by family:
- Carrot family, Apiaceae (Umbelliferae)—carrot, celery, celeriac, dill, parsley, parsnip;
 - Hemp family, Cannabaceae—hemp;
 - Dichondra family, Dichondraceae—dichondra;
 - Geranium family, Geraniaceae—alfilaria;
 - Mint family, Lamiaceae (Labiatae)—sage, summer savory; benne family, Pedaliaceae—sesame;
 - Rose family, Rosaceae—little burnet;
 - Nightshade family, Solanaceae—eggplant, tomato, husk tomato, pepper, tobacco; and
 - Valerian family, Valerianaceae—cornsalad.
- (a) General description.
 - (1) Germination habit: Epigeal dicot.
 - (2) Food reserves: Cotyledons; endosperm may or may not be present, depending on the kind.
 - (3) Shoot system: The hypocotyl elongates, carrying the cotyledons above the soil surface. The epicotyl usually does not show any development within the test period.
 - (4) Root system: A primary root; secondary roots may or may not develop

within the test period, depending on the kind.

- (b) Abnormal seedling description.
 - (1) Cotyledons:
 - (i) Less than half of the original cotyledon tissue remaining attached.
 - (ii) Less than half of the original cotyledon tissue free of necrosis or decay.
 - (2) Epicotyl:
 - (i) Missing. (May be assumed to be present if the cotyledons are intact.)
 - (ii) [Reserved]
 - (3) Hypocotyl:
 - (i) Malformed, such as markedly shortened, curled, or thickened.
 - (ii) Deep open cracks extending into the conducting tissue.
 - (iii) Watery.
 - (4) Root:
 - (i) None.
 - (ii) Missing or stubby primary root with weak secondary or adventitious roots.
 - (5) Seedling:
 - (i) One or more essential structures impaired as a result of decay from primary infection.
 - (ii) Albino.

[59 FR 64506, Dec. 14, 1994]

§ 201.57 Hard seeds.

Seeds which remain hard at the end of the prescribed test because they have not absorbed water, due to an impermeable seed coat, are to be counted as “hard seed.” If at the end of the germination period provided for legumes, okra, cotton and dichondra in these rules and regulations there are still present swollen seeds or seeds of these kinds which have just started to germinate, all seeds or seedlings except the above-stated shall be removed and the test continued for 5 additional days and the normal seedlings included in the percentage of germination. For flatpea, continue the swollen seed in test for 14 days when germinating at 15–25 °C or for 10 days when germinating at 20 °C.

[5 FR 33, Jan. 4, 1940, as amended at 10 FR 9952, Aug. 11, 1945; 20 FR 7936, Oct. 21, 1955; 65 FR 1708, Jan. 11, 2000]

§ 201.57a Dormant seeds.

Dormant seeds are viable seeds, other than hard seeds, which fail to germinate when provided the specified

germination conditions for the kind of seed in question.

(a) Viability of ungerminated seeds shall be determined by any of the following methods or combinations of methods: a cutting test, tetrazolium test, scarification, or application of germination promoting chemicals.

(b) The percentage of dormant seed, if present, shall be determined in addition to the percentage of germination for the following kinds: Bahiagrass, basin wildrye, big bluestem, little bluestem, sand bluestem, yellow bluestem, bottlebrush-squirreltail, buffalograss, buffelgrass, galletagrass, forage kochia, blue grama, side-oats grama, Indian ricegrass, johnsongrass, sand lovegrass, weeping lovegrass, mountain rye, sand dropseed, smilo, switchgrass, veldtgrass, western wheatgrass, and yellow indiagrass.

(c) For green needlegrass, if the test result of method 2 is less than the result of method 1, subtract the result of method 2 from method 1 and report the difference as the percentage of dormant seed. Refer to §201.58(b)(7).

[46 FR 53638, Oct. 29, 1981, as amended at 59 FR 64506, Dec. 14, 1994]

§201.58 Substrata, temperature, duration of test, and certain other specific directions for testing for germination and hard seed.

Specific germination requirements are set forth in table 2 to which the following paragraphs (a), (b), and (c) are applicable.

(a) *Definitions and explanations applicable to table 2*—(1) *Duration of tests*. The following deviations are permitted from the specified duration of tests: Any test may be terminated prior to the number of days listed under “Final count” if the maximum germination of the sample has then been determined. The number of days stated for the first count is approximate and a deviation of 1 to 3 days is permitted. If at the time of the prescribed test period the seedlings are not sufficiently developed for positive evaluation, it is possible to extend the time of the test period two additional days. (Also, see paragraph (a)(5) of this section and 201.57.)

(2) *Light*. Cool white fluorescent light shall be provided where light is required in table 2. The light intensity

shall be 75 to 125 foot-candles (750–1,250 lux). (The light intensity for nondormant seed and during seedling development may be as low as 25 foot-candles to enable the essential structures to be evaluated with greater certainty.) The seeds shall be illuminated for at least 8 hours every 24 hours except when transferred to a low temperature germinator during the weekend. When seeds are germinated at alternating temperatures they shall be illuminated during high temperature periods. Seeds for which light is prescribed shall be germinated on top of the substratum except for ryegrass fluorescence tests.

(3) *Moisture-on-dry-side*. This term means that the moistened substratum should be pressed against a dry absorbent surface such as a dry paper towel or blotter to remove excess moisture. The moisture content thus obtained should be maintained throughout the germination test period.

(4) *Potassium nitrate* (KNO₃). These terms mean a two-tenths (0.2) percent solution of potassium nitrate (KNO₃) shall be used in moistening the substratum. Such solution is prepared by dissolving 2 grams of KNO₃ in 1,000 ml. of distilled water. The grade of the potassium nitrate shall meet A.C.S. specifications.

(5) *Prechill*. The term “prechill” means a cold, moist treatment applied to seeds to overcome dormancy prior to the germination test. The prechill method varies among kinds, but is usually performed by holding imbibed seeds at a low temperature for a specified period of time. The prechill period is not included in the duration of tests given in table 2, unless otherwise specified.

(6) *Predry*. The term “predry” means to place the seed in a shallow layer at a temperature of 35 ° to 40 °C. for a period of 5 to 7 days, with provisions for circulation of the air.

(7) *Substrata (Kinds)*. The symbols used for substrata are:

B= between blotters

TB= top of blotters

T= paper toweling, used either as folded towel tests or as roll towel tests in horizontal or vertical position

S= sand or soil where soil is an artificial planting mix of shredded peat moss, vermiculite, and perlite

TS= top of sand or soil